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DATA PROCESSING DIGEST

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General Information

"Making a computer pay"

Dr. H. N. Laden, Chesapeake & Ohio Railway Co.
PAPERWORK SIMPLIFICATION, Second Quarter, 1956; pages 12–17.

The C. & O.'s computer applications include dividend checks and proxy statements; Purchasing and Stores–Materials Accounting; sales analysis; Car Accounting; budget preparation and cost control, work scheduling and performance measurements in the Construction and Maintenance Departments. For each of these a computer strategy committee has been formed.

The steps being followed in planning for the programming of these applications on the Univac is as follows:

Analysis of old system:

Study the operation--exceptions as well as routine.

Determine all the inputs--origin, distribution, nature and format of source documents, master reference files, standard rules, telephones reports.

Determine all the output requirements--distribution, contents, and format of finished reports, vouchers, checks, etc.

Synthesis of new system:

Coordinate collection of inputs--revise procedures, eliminate duplication, provide control of quality, standardization of format, etc.

Coordinate production of outputs by relating all those dependent on same basic inputs--revise procedures, eliminate duplication and non-essentials.

Construct over-all diagram of logical blocks for going from inputs to outputs showing gross steps which are "computer feasible."

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Subscription information and the addresses of publishers of digested articles are given on page 20

Provide communications and data conversion procedures for getting input into computer and computer output delivered to users.

Process analysis:

Break down diagram of gross operations into associated tape and computer runs--a) establish tape organization--tape labels, volumes, probable size of tape item, Uniservo (tape handler) assignment; b) coarse description of tape processing for each run.

Reduce each run to detailed flow chart showing item layout, detailed manipulation, all logical decisions and alternative choices, intermediate check points, etc.

Coding:

Reduce each flow chart to a sequence of Univac instructions using 45–order Univac vocabulary.

Enter the coded program on tape.

Provide detailed instructions to each control engineer–Univac system and auxiliary units.

Test:

Make up sample data and manually follow through processing.

Trial machine run of program on sample data.

De–bug program–find errors, eliminate them.

String related runs together and de–bug on sample data.

Trial machine run on actual data and de–bug.

Parallel operation with existing system--compare and revise.

Cut over:

Assume production responsibility.

"Electronics in Management"

Edited by Lowell H. Hattery and George P. Bush
New book published by University Press

Broad management view of electronics

The editors claim that "those who have computers say that the only experts are those who don't have them." By their definition, this is a collection of papers by experts and non-experts, adapted from the proceedings of the First Institute on Electronics in Management, presented at The American University in November 1955. The emphasis in this collection is

on management, with the tone set by Dr. Hattery in Chapter 1, "Management Impact of Electronic Systems." Of significance in this chapter is his statement that the "parochial approach ((that is, a wholly financial or mathematical viewpoint)) to management of electronic systems is a hazard to the essential teamwork for the most effective system." He favors a broad representation in the computer management program.

Part II consists of four chapters on the development and present state of equipment. Of these four, the most valuable chapter would seem to be the last one on selecting equipment. This chapter makes liberal use of direct quotes from others on this problem, and presents well the complexity of evaluating the potential application in any organization for the various types of equipment.

Part III presents some case studies of the use of electronic equipment in the Census Bureau, the Air Force, the Aviation Supply Office, and the Treasury Department. Part IV presents eight chapters on the selection and application of computers from management viewpoint. This includes cost considerations, procedures, training, personnel problems, organizational patterns, and problems of management in setting up a computer program. Appendices on linear programming, and the recent Congressional hearings on automation, a bibliography and index conclude the book. Price: $6.00.

"Appraisal of electronic business applications"

OFFICE MANAGEMENT, May 1956 No. 5A

General view of business electronics

A special edition of OFFICE MANAGEMENT is added to the May issue each year. This year the issue is composed of a group of papers presented by Ernst & Ernst personnel at their Eastern District Client Executive Conference in January 1956. The papers cover the range of electronic data processing from the simplified explanation, through an explanation of programming, integrated data processing, the use of memory systems, output equipment requirements, descriptions of available computer systems, planning for electronics, the use of operations research techniques, and automation in office and factory. The papers are brief, and liberally illustrated with photographs of equipment and diagrams.

"Office mechanization and the purchasing agent"

John E. Westhoff, First National Bank of Minneapolis
JOURNAL OF MACHINE ACCOUNTING, June 1956, pages 23, 24, 40, 41.

Equipment selection

"...the purchasing agent with buying and inventory control knowledge should be brought into the (office automation) picture now. The design of forms and specifications for equipment will always be the responsibility of the machine accountant, but ...the purchasing agent should carry the ball from this point on."

"The Electronic Data Processing Industry"

A study prepared by Arthur D. Little, Inc., Cambridge, Mass.
Published by White, Weld & Co., New York

A survey of machines and their applications

Here is an unbiased report on the present state of the electronic data processing industry. It is brief and to the point, written in a clear, concise and conversational style. The report is presented in two sections as follows.

The Problem: This section begins with a brief history of computing needs in business from the earliest use of arithmetic through the punched-card machines, and into the use of electronics. The second part of this section gives a simple explanation of electronic digital computers and analog computers. Continual reference to business needs and comparison with manual and punch-card methods brings the description more closely within the experience of the reader.

The Solution: This section begins by examining the computer industry and the potential markets for computers in business, science and engineering, and government. A formula is suggested by which companies can estimate the value of investing in an electronic computing system. The formula, derived and explained in a logical fashion, is:

(cost of machine) + 5 x (annual maintenance) = 5% (annual sales).

The report does not give a parallel formula for scientific uses, but states the value of having a computer is determined rather, by "management's attitude toward research, and toward supplying the proper tools for it."

Computers now on the market are presented in a table form with descriptions that are less technical and more practical for the non-engineering reader.

Brief discussions on availability, future trends, new developments and obsolescence, and a buyers' guide on the companies whose equipment is listed conclude the report. A 53-word glossary will be of interest to those unfamiliar with computer terminology. Price: $7.50.

"Electronics in Business—A Descriptive Reference Guide"

Supplement # 1
Published by Controllership Foundation

Bibliographic supplement

This is a supplement to the reference guide published in July, 1955, and brings that one up to date through December 1955. (See DPD, September 1955, page 14.) The guide lists articles from periodicals (along with addresses of publishers and prices), proceedings, books, conferences and training programs, films, electronic data processing systems, installations, computing centers, book publishers and organizations. Price: $3.00 (For members of Controllers Institute: $2.00.)

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"Cost studies in automation"

John L. Marley
AMERICAN BUSINESS, May 1956; pages 20–22, 40, 42.

Punch–card costs as a basis for computer readiness

Cost experience in present punched-card operations is suggested as a yardstick for measuring readiness for electronic computer operations. A study of the punched-card operations of five companies varying in size from 1000 to 12,000 employees provided a basis for the following generalized conclusions: "As a company increases in size, the per cent of total card origination costs tends to decrease in terms of total cost."

"The cost of equipment for card origination increases as the personnel costs decrease."

"The ratio of personnel costs to machine costs decreases in relation to company size."

"Operating a medium-sized computer involves the same fluctuations due to size and scope of activities as in a growing tabulating machine operation."

"Electronic computer operation cannot practically eliminate all punched-card processing costs."

"The gains resulting from introduction of an electronic system may be offset by the costs of programming even after the computer is installed."

"The apparent break-even point hovers around 5000 employees, or paper work volume comparable to a company of that size."

"Retention and Preservation of Records with Destruction Schedule"

Published by Record Controls, Inc.

An aid in determining length of storage

In record retention, a "sensible middle path" should be aimed at between ruthlessly destroying old paper and keeping everything indefinitely. A first important step in establishing sensible record retention is to define "records" and determine which ones are of permanent importance, which of transitory importance. This booklet offers some excellent suggestions for evaluating a record retention program, and for setting up destruction schedules. It discusses various methods of storage, such as microfilming, auxiliary filing rooms, and fireproof storage. In Part II Federal regulations affecting record retention are presented, and Part III gives state regulations. Part IV reports on a survey made of a number of business organizations on the length of time 250 records common to most businesses were retained. A bibliography on record retention is included. The booklet may be ordered from Record Controls, Inc., 209 South LaSalle Street, Chicago 4, Ill. Price: $4.00. ((Other offices are 516 Fifth Avenue, New York 36, N. Y.; and West Coast Consultant, Dr. Fred S. Cook, P. O. Box 353, Palo Alto, Calif.))

"A progress report of our computer installation"

Eugene R. Donat, Collins Radio Company, Cedar Rapids, Iowa
N.A.C.A. BULLETIN, June 1956; pages 1208–1222.

Accounting and engineering share time

In selecting an electronic computing system the Collins Radio Company considered the following factors: versatility, speed and capacity, accuracy, reliability, expandability, compatibility (with the existing tab system), technical training and assistance, lease vs. purchase, cost, availability. An IBM 650 was selected for delivery in January 1956. The intervening eight months were used to set up the computer system staff, composed of the manager of the existing data processing services department (reflecting the plan to integrate computer and tab activities into a single system), a systems control staff member as a consultant, two programming analysts from the existing data processing department, and two mathematical analysts to serve independently as programmers for all engineering applications. Two-thirds of the available computer time is reserved for accounting applications and the remaining one-third for engineering applications.

"How automatic machines can simplify a system"

George J. Kelley and Kenneth A. McCarthy, Swank, Inc., Attleboro, Mass.
THE OFFICE, July 1956; pages 8–25.

Paper tape replaces key punch

Looking toward the future when the company may have an electronic computing system, Swank, Inc. is now reducing the information-preparation function of its centralized tabulating department, and developing a decentralized IDP set-up. "We intend to adapt our systems to punched tape until we have practically all information entering the tabulating department in this manner. Then, we believe, we can put several systems on the computer at one time and realize immediate savings and/or speed, rather than wasting expensive capacity by gradual conversion."

"Within a relatively short time we expect to eliminate practically all key punching and verifying in the tabulating department, and process punched tape coming from the various decentralized sources. This places responsibility where it belongs. Accuracy should be considerably improved, work can be properly scheduled for high speed tabulating equipment to properly utilize machine capacity, and considerable savings will result from these steps as well as doing mechanical key punching as a by-product of original work."

"The Computer Directory"

COMPUTERS AND AUTOMATION, June 1956.

Annual issue

The annual Computer Directory includes a roster of organizations in the computer field, products and services, Who's Who in the computer field, and a roster of automatic computers.

"The impact of automation on management accounting"

David J. Young, The Steel Company of Wales Ltd.
THE ACCOUNTANT, June 9, 1956; pages 648–653.

Training of accountants

The concern of accountants in Great Britain over their place in the new ways of management are similar to those of U. S. accountants. In this article the author challenges the accountant to search his profession for answers to these questions:

a) does the present training of the accountant give him enough knowledge of the economic results of automation?

b) does his training include the significance of capital expenditures?

c) are clerical procedures being studied for use of electronic equipment?

d) is his profession attracting enough intelligent young people to handle the new methods and machines?

"Automatic control"

Articles from SCIENTIFIC AMERICAN
Published by Simon & Schuster, Inc.

Significance of automation

Twelve articles on automatic control have been assembled from the pages of SCIENTIFIC AMERICAN over the past several years. These are divided into four sections: 1) Feedback: the principle of control; 2) The second industrial revolution; 3) Information: the language of control; 4) Machines and men. The articles probe the meaning of automatic control as it is applied to machines and to the administration of business and government. Because information is essential to automatic control, symbolic representation of information by the use of numbers is discussed. Finally, machines are compared with lower forms of animal life and with humans, with some conjecture on the similarities between the human brain and the electronic computing device. (Price: $1.00.)

"Machine Literature Searching"

James W. Perry, Allen Kent, Madeline M. Berry
New book published by Western Reserve University Press and Interscience Publishers

Research in principles of mechanized cataloging

Although mechanical and electronic methods of automatically storing and searching for information are already well along in their development, the methods by which this information may be indexed and coded are still in early experimental stages. This collection of papers brings to a focus the problems of indexing the mounting volume of graphic records which comprise our recorded knowledge.

In the Foreword, Dean Jesse H. Shera of the School of Library Science, Western Reserve University, writes: "In these exploratory essays [the authors] are in search for the fundamental principles that are essential to a better understanding of mechanized bibliographic organization..." The papers are concerned with the classification of subject matter, code construction, information retrieval, preparation of abstracts for encoding, searching problems, and many other related topics. The first ten articles are reprinted from AMERICAN DOCUMENTATION. The last five appear in print here for the first time. An annotated bibliography is included, and its content may be revealing to persons who have not been aware of the activity in this field during the past ten years. Price: $4.00.

"Is conventional tabulating equipment in the twilight zone?"

Charles E. Spring, Du Pont Co., Kingston, N. C.
SYSTEMS AND PROCEDURES QUARTERLY, May 1956, pages 13–18.

Tab equipment still useful for small companies

The answer given in the article is "yes." Three advantages and three disadvantages of tabulating machine systems are given. Advantages: unitized structure (only enough equipment necessary for present need be obtained--but unitized computing equipment and special purpose computers will cancel out this advantage); improved machines now have electronic components; unlimited storage in readable form. Disadvantages: excessive number of employees; excessive and slow data handling; excessive number of machines. The biggest disadvantage of tab equipment is cost. Medium-size companies (100–1000 employees) can expect to use tab equipment for some time, although new equipment in the computer and common language classes is becoming available. "It is unlikely that small companies can afford electronic computers for a long time. However, there will be...service bureaus with all the experience and know-how of the larger companies." Also, the new techniques of integrated data processing hold opportunities for the small organization.

"Proceedings, Automatic Data Processing Conference"

Harvard University, September 1955
Published by Harvard University

The process of selection and application of electronic business equipment

Twelve papers are included in these published proceedings, divided into five sections: Basic principles and techniques, Centralized vs decentralized organization for data processing, Criteria for selection of equipment, Case studies of applications, and Operations research and data processing.

The first section begins with an explanation of data processing methods, then shows how an electronic computing system can be used to process data, finally suggests a pattern for a company to use in making a study of their data processing requirements. Part two attacks the problems of centralization and decentralization which must be considered in setting up an electronic data

processing system. Part three considers the equipment, both general and special purpose, and the selection of an application for mechanization. In part four, detailed descriptions are given of an inventory problem and a payroll application. Part five extends the use of data processing into the area of operations research. Price: $3.50.

"Computers--their operation and application"

Edmund C. Berkeley and Lawrence Wainwright
New book published by Reinhold Publishing Corp.

Semi–technical

In attaining their purpose, "...to present basic information about computers, particularly automatic computers...", the authors have developed in great detail the part related to the operations of computers, with less emphasis on the application. The first six sections are devoted to the theory of automatic computing, the handling of numbers, the electronic counterparts of arithmetic processes, the difference between digital and analog computing, specific types of automatic computers, and a rather detailed description of the design of a small computer usable for training purposes. It is conceivable that this section of the book could be of value to persons entrusted with the planning of a college, or even high school course of study for beginning computer engineers and technicians. The last two sections are mainly a compilation of information of a reference nature, such as breakdowns of computer uses in various types of applications, books and organizations, glossary, etc. Price: $8.00.

"Faster, faster"

W. J. Eckert and Rebecca Jones, Watson Scientific Computing Laboratory
Published by McGraw–Hill Book Co., 1956.

Ordnance computer

The NORC, built by IBM for the Bureau of Ordnance, U. S. Navy, is the subject of this book. The NORC's operation, and its applications at the BuOrd are given in simple language. In addition, for the experienced programmer, more technical details of the operations, timing and programming of the NORC are given. Price: $3.75.

Equipment

"Office Automation" Up-dating Service-- Newsletters 8 and 9.

R. Hunt Brown, Automation Consultants, Inc., New York

Automatic reservations systems

Included in this material are descriptions of the American Airlines Reserwriter (IBM) and the Northwest Orient Airlines Univac Reservation System, utilizing a Univac File Computer.

IBM

In the Reserwriter system, a special form printed on a punch card is filled out by the reservations clerk and sent to the keypunch operator via conveyor belt. The operator inserts the card into the keypunch and punches the handwritten information into the card. At the same time the information is typed automatically at the top of the card. The card is then placed into the Reserwriter which scans the information on the card and makes the following decisions: whether to send a message, where to send the message, what to include and how to organize the message, what routing codes to provide. The Reserwriter generates as many messages as are needed to complete the routing of the reservation (for example, if more than one airline or more than one plane is required). The Reserwriter then reproduces each message on paper tape which is automatically fed into the Teletype system and sent on its way. An automatic electric typewriter types out the Reserwriter's messages for monitoring purposes. Special problems are typed in red for manual handling. The system is in use in Buffalo, and is tied in with the Magnetronic Reservisor at the American Airlines office in New York City.

Univac

Information about the Univac Reservation System contains the following:

"When an agent receives a reservation request he uses his Agent Set to determine flights servicing the destination, their scheduled dates, times and similar information. This data is stored within the Agent Set on specially coded timetables.

"Once initial flight information has been determined, the agent addresses an 'inquiry' to the system's master control by means of punch keys on his set. An almost instantaneous reply is received showing space availability and flight information.

"The system can transmit facts on as many as eighty flight legs in a single reply.

"After a flight has been selected by the passenger, the agent records the 'sell' transaction with other keys on the set. This 'sell' transaction is transmitted to the master control which automatically and immediately adjusts data related to the selected flight to show its altered status.

"Main functioning member of the reservation system is a Univac File Computer, specially adapted by means of peripheral equipment to meet gener-

al air transportation and individual airline requirements. Magnetic storage drums, each with a capacity of 180,000 characters of flight information, are utilized by the computer. This means a storage capacity of approximately 9000 flight legs. Up to ten of these drums can be incorporated in the reservation system for a total storage capacity of nearly two million characters."

"Burroughs G–101 High Speed Printer"

E. M. DiGiulio, Control Instrument Co. (Burroughs Corp.)
IRE Convention Record, Part 4, 1956; pages 94–98.

Dual card feed high speed printer

The G–101 High–Speed Printer transcribes information from coded punched cards on to final printed forms at the rate of 900 forty–eight character lines per minute. It is particularly suitable for large volume quality printing such as billing and renewal notices, mailing lists, and promotional material. The printer's dual card feed makes it possible to select data from two separate files without the necessity of temporary merging and subsequent de-collating. Eighteen hundred cards per minute can pass through the machine in the dual operation. Future machines will incorporate a bill feeding device which provides for printing directly on tabulating cards. Another addition will be the printer punch capable of punching up to 40 card columns at a rate of 450 cards per minute. This feature, however, will reduce the output rate of the whole equipment to 300 cards per minute when two lines are to be printed per card.

(See also "Electronic addressing" MANAGEMENT METHODS, July 1956, page 4.)

"Let's look at the available business–data processors"

James Gibbons, Price, Waterhouse & Co., New York
CONTROL ENGINEERING, July 1956; pages 101–111.

Equipment charts

A very thorough evaluation of available business data processing systems is given. A chart of equipment characteristics, and an illustrative flow diagram and program-step chart of a representative inventory control problem is presented, along with a number of illustrations and diagrams of equipment. Feasibility study committee will find this article helpful.

"Quasi–random access memory systems"

G. L. Hollander, Clevite Research Center, Cleveland
AIEE Conference Paper #CP 56–661

TapeDRUM

In cases where random access is required, but longer delay times can be tolerated, a slower and less expensive memory such as the TapeDRUM can be used in a quasi-random fashion to achieve the desired results, instead

of a memory specifically designed for random access processing.

(See also DPD June 1956, page 9.)

A copy of this paper may be obtained from the American Institute of Electrical Engineers, 33 W. 39th St., New York 18, N. Y. Price: 40¢ to members of AIEE, 80¢ to non-members.

Management Decision-making Techniques

"Research problems in production routing and scheduling"

A. J. Rowe and J. R. Jackson, Management Sciences Research Project, University of California at L. A.

JOURNAL OF INDUSTRIAL ENGINEERING, May–June, 1956; pages 116–121.

The problems of *routing* and *scheduling* are strongly interdependent. For theoretical studies, this area can be separated into three problems:

1 – "*Choice of routings.* A routing for a given item is a designation of the types of machines which may perform each of the required operations. It may specify one machine type for each operation, or it may list two or more alternatives.

2 – "*Choice of lot sizes.* In general, these may vary from one lot to another of the same item.

3 – "*Choice of scheduling method.* A scheduling method is...a way of answering questions of the type, 'What should this machine be doing now?'"

The interdependences are:

"A. Since many machines are economical only for production runs within certain size ranges, the choice of routings largely determines the choice of lot sizes, and conversely.

"B. The choice of routings and lot sizes restricts the choice of schedules....

"C. ...scheduling possibilities must be among the primary considerations in choosing routings and lot sizes.

"D. In order to be effective in the face of the unpredicted occurrences which are inevitable in actual production, scheduling must be accomplished by a

dynamic procedure which takes into account the actual situation at the time when the question, 'What should this machine be doing now?' is asked."

"...Current practice in dealing with the problems of routing and scheduling often seems inadequate. On the other hand, the results of mathematical and theoretical investigation have been very limited....direct experimentation is largely impractical.

"Thus we are led to simulated experimentation....This technique is similar to the engineering method of building a model and testing its performance.

"The first step toward simulated experimentation...is to construct a conceptual model which represents the manufacturing plant and the work to be done, in arithmetical and logical terms. This model may be very simple, omitting many details...or it may be extremely complex...

"The second step is to program a computer, human or electronic, to simulate the operation of the plant, by 'operating' the model."

((A simple example is given to illustrate a step-by-step procedure for simulating a shop.))

Linear programming has been used in the choice of routings; but it is hoped that simulated experimentation will help study the inter-dependence of routing and scheduling.

"Optimizing with a computer"

John D. Strong, Electrical Associates, Inc., Princeton, N. J.
AUTOMATIC CONTROL, June 1956; pages 16–19.

Analog computers for OR

It is suggested that analog computers are often superior to digital computers in the solution of operations research problems. Advantages of analog computers are simplicity of operation, higher speeds, lower costs. Thus they are ideal for smaller problems and for location in plants next to mixing and blending processes which they are optimizing. Electronic Associates, Inc. has built the Operations Control Computer, an analog machine available for rental or demonstration. "It is expected that work with this computer will be the basis for an entire new line of standard computers specifically intended for Operations Research or to facilitate applications of existing general purpose computers."

Applications

Lyons Electronic Office (LEO), J. Lyons & Co., England

OPERATIONAL RESEARCH QUARTERLY (Operational Research Society, London), June 1956; pages 42, 43.

Teashop ordering by electronics

The J. Lyons & Co. has been using its own computer (LEO) in payroll operations for some time. After establishing this application, they turned their attention to the daily task of ordering for the numerous teashops in their organization. "...The central office keeps a record of the manageress's order estimated in advance, and every day the manageress revises it, altering it only in respect of the requirements which have changed. If the manageress is lazy, or is rushed, or falls down dead the order goes through as originally estimated.

"Each manageress is rung up daily by Cadby Hall at a set time, after she has reviewed her advance order. She is asked to quote for any item for which she wants to make a change, the item number and the new amount required. This is all the new information that needs to be given to Leo to enable it to work out the full revised order.

"The information is punched straight on to a card by the girl at the telephone, who then calls it back to the manageress. The cards are then taken into the computing room next door and put in order and processed through the computer. This produces the packing lists, which are taken downstairs to where the packing takes place for the first delivery in the morning. Concurrently with this process further statistics are produced for the use of the management.

"While the packing lists are being printed, totals are being built up and at the end of the computer run a reconciliation is provided which proves that everything has been done correctly."

"'Automating' process planning"

PRODUCTION, July 1956; pages 80, 81.

Work scheduling

Northrop Aircraft uses its electronic computers to calculate shop time and schedule work for every machine in its machine shop. Contracts are broken down into individual machine operations which are matched up with cards containing all the machining information about that particular operation. From this, "operations cards" are punched which give all the production information necessary for each machine shop operation. These cards become the machinist's work orders on which he notes hours, parts completed and machine number, after he has completed the job. The inspection department fills out a completion card which is used by the Planning Department to find which parts are in deficit. Each day all cards on completed jobs are processed to show what machine shop operations are completed and what parts are accepted by the inspectors. The machine shop gets a daily report on the previous day's work, showing what jobs are still in the shop, how long until completion, and which machines are open.

"Specialist in the computing field"

BUSINESS WEEK, July 7, 1956; pages 135, 136.

Savings bank system

Teleregister's electronic accounting system for The Howard Savings Bank is illustrated, along with a suggestion that the system may be used cooperatively by groups of small savings banks as well as by large individual savings organizations.

"Immediate account information is available at any branch under new system installed by Jersey bank"

OFFICE MANAGEMENT, July 1956; page 59.

Teleregister's data processing system designed for The Howard Savings Institution (see above) gives tellers in the main office or any of the five branch offices immediate information about any account at any branch. Deposits or withdrawals are recorded immediately on central office memory drums by any teller. The system also computes interest and can handle accounting procedures for mortgages, and savings club accounts.

"General Insurance clears decks for Datatron"

JOURNAL OF MACHINE ACCOUNTING, July 1956; page 20.

All files on tape

General of America of Seattle, Washington, is installing a complete Datatron system consisting of the basic computer and console, four Datareader magnetic tape storage units, and a punched card input–output unit. The system will be applied to: 1) policy-handling for Safeco automobile insurance 2) report making, and 3) agents' account checking. All files will be maintained on magnetic tape. Space savings will be 93%, since one 10-inch reel of tape holds the equivalent of 50,000 punch cards.

"Small companies can afford electronic processing"

Herbert O. Brayer
AMERICAN BUSINESS, June 1956; pages 19, 44.

EDP service bureau

A centralized service bureau in Erie, Pennsylvania is providing fast daily reports and summaries for more than a dozen small companies in surrounding areas from data sent by teletype or on punched paper tape by messenger or mail service. Payroll reports, sales information and production reports are prepared by the service bureau.

Comment

A Home Study Course

Training for Programming

A year ago there were few books from which the student of EDP could gain practical knowledge. Today, the student can pick and choose from many books. In addition, he can subscribe to various information services, or take a course in a variety of classifications of EDP (from management planning to computer programming). Among them certain ones stand out as a more effective answer to the need. We would like to describe one of these this month. It is difficult to classify, for although it is essentially a training course, it is also an excellent text book on computer applications and programming.

"Programming for Business Computers"* is a home study course designed to help persons prepare themselves for programming jobs which will become available in the future. The student progresses at his own speed by means of the excellently presented lessons which are mailed to him in four sections. At the end of each lesson assignment is a list of review questions for the student to answer for his own benefit. Twenty-three workshop assignments are spaced among the lessons. These consist of practical problems which need for their solution the knowledge gained through the lesson assignments.

The workshop assignments gradually work up to a series of programming problems on inventory, payroll, sales analysis, accounts receivable, etc. These are programmed for an imaginary but practical computer, BEC, designed for the course by the Business Electronics Inc. Programming Instruction Staff. The BEC is a single-address, internally programmed, automatically sequenced digital computer with magnetic core storage. It is introduced early in the course with the lesson on addressing systems, and is described as typifying the outstanding features of several commercial computers. Thus the student learns how a computer works (from the programmer's viewpoint) through acquaintance with a specific (albeit non-existing) machine. After the student has learned to program problems on BEC as a single-address machine, one of the problems is selected for solution with BEC given other types of addressing systems. Finally, the student studies portions of the programming manuals of several actual computers.

After completing this assignment, the student should certainly find that in the words of the study course, "he has a better than average knowledge of each machine and that with BEC as a background he is far better able to understand and evaluate any machine with which he may come in contact."

Individual help

Throughout the course, the student may have individual help from the BE Instruction Staff at his request. Also, school solutions to the workshop problems are sent to the students after their work has been sent in and graded, so they can compare their solutions with those of the instructors. The content of the lessons is of very high caliber. Explanations are clear and easily understood; examples, diagrams and illustrations are plentiful. The course shows evidence of careful planning and teaching skill.

We believe "Programming for Business Computers" is an excellent course in programming, and has the advantage of home study at the student's own pace. Further information may be obtained from J. H. Herrett, Director of Education, Business Electronics Inc., P. O. Box 3330, Rincon Annex, San Francisco 19, California.

*See DPD, January 1956, page 17.

OTHER ARTICLES OF INTEREST

"Removing the mystery from electronic data processing"

JOURNAL OF MACHINE ACCOUNTING, July 1956; pages 12–13, 26–27.

"How electronics move the railroads"

RAILWAY AGE, July 16, 1956; pages 36–39.

"Mathematical models for today's management"

OFFICE MANAGEMENT, July 1956; pages 20–22, 71–74.

"What it means to integrate data processing"

N.A.C.A. BULLETIN, June 1956; pages 1191–1198.

"Elements of office automation--and preparing for it"

N.A.C.A. BULLETIN, June 1956; pages 1199–1207.

"Business applications of the electronic computer"

THE ACCOUNTANT (English), May 26 and June 2, 1956.

"The future of automation"

BEST'S LIFE NEWS, June 1956; pages 45–51.

"Operations research: can you use it?"

NATION'S BUSINESS, July 1956; pages 58–65.

"Comments on electronics"

BEST'S LIFE NEWS, July 1956; pages 49–52.

"Inventory warehouse control"

THE CONTROLLER, June 1956, pages 274, 276, 277.
(See DPD: January 1956, page 1, Chrysler Corp. MoPar.)

"Useful applications of a magnetic–drum computer"

ELECTRICAL ENGINEERING, July 1956; pages 634–639.
(See DPD February 1956, page 8, Librascope LGP–30)

The above articles are largely introductory in nature and include information that has previously been reviewed in DPD.

Training

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UNIVERSITY OF ILLINOIS

September 1956 **Dayton, Ohio**	Office Automation, evening classes at University of Dayton, tentatively set for September. For further information write: Mr. Arthur L. Holt, University of Dayton, Dayton 9, Ohio.
September–June, 1956–57 **Pittsburgh, Pa.**	Electronic Data Processing Courses: Data Processing Principles and Methods, Data Processing Laboratory, Business Applications of Data Processing Equipment, Laboratory in Business Applications of Data Processing Equipment, Managerial Aspects of Electronic Data Processing, Individual Research on Data Processing Applications. For information write to Bureau of Business Research, University of Pittsburgh, Pittsburgh 13, Pa.
September 4–7, 1956 **Denver, Colo.**	Special advanced course in computer techniques, by Dr. John W. Carr of U. of Michigan. For information write to William B. Kennedy, The Denver Research Institute, University of Denver, Denver 10, Colo.
September 4–15, 1956 **Cleveland, Ohio**	Operations Research, a short course offered by Case Institute of Technology. For information write: W. W. Abendroth, Operations Research Group, Engineering Administration Dept., Case Institute of Technology, 10900 Euclid Avenue, Cleveland 6, Ohio.
September 10–21 **Los Angeles, Calif.**	Simulation and Theory of Traffic Flow, University of California at Los Angeles. For information write to University Extension or the Institute of Transportation, University of California, Los Angeles 24, California.
September 17–21, 1956 **New York, New York**	"Electronic Data Processing for Business and Industry," Hotel Roosevelt. Presented by Canning, Sisson and Associates and Data Processing Counselors. For information write Data Processing Counselors, 130 East 59th Street, New York 22, N. Y.
Sept. 24, 1956 **Philadelphia, Penn.**	"Elements of Electronic Data Processing," Fall semester, Temple University. For information write: Professor T. E. Fitzgerald, Temple University, Philadelphia, Penn.
October 29–November 2, 1956 – Cleveland, Ohio	Special Seminar Program, Western Reserve University, School of Library Science: Machine Literature Searching, Operations Research Approach, Theory of Classification. For information write to Jesse H. Shera, Dean, School of Library Science, Western Reserve University, Cleveland 6, Ohio.
February 4–8, 1957 **Cleveland, Ohio**	Special Seminar Program, Western Reserve University, School of Library Science: Documentation Survey, Machine Aids to Librarianship, Special Libraries. For information, write as above.

January 30–February 1, 1957 Cleveland, Ohio	Operations Research in the Planning of Computer and Data Processing Systems, Case Institute of Technology. For information write: W. W. Abendroth, Operations Research Group, Engineering Administration Dept., Case Institute of Technology, 10900 Euclid Avenue, Cleveland 6, Ohio.

Meetings

August 21–24, 1956 Los Angeles, California	WESCON Convention – includes a session on Computers--Data Gathering and Presentation Systems. For information write WESCON, 344 North La Brea, Los Angeles 36, Calif.
August 27–29, 1956 Los Angeles, Calif.	Annual Meeting, Association for Computing Machinery, U.C.L.A. For further information write: Association for Computing Machinery, 10749 Sarah St., North Hollywood, Calif.
September 17, 18, 1956 New York	Data Handling Workshop, Instrument Society of America, Hotel New Yorker. Automatic and semi-automatic handling and reduction of data (engineering and scientific data).
September 30– October 3, 1956 New York	National Conference, Controller's Institute, Waldorf–Astoria.
October 18, 19, 1956 Los Angeles, California	Meeting of The Institute of Management Sciences, Statler Hotel.
October 22–24, 1956 Philadelphia, Pa.	International Systems Meeting, Annual Convention of the Systems and Procedures Association of America, Bellevue-Stratford Hotel. For information write to J. A. MacQueen, Alan Wood Steel Co., Conshohocken, Pa.
November 8, 9, 1956 San Francisco, Calif.	N.M.A.A. Second Annual Electronic Business Systems Conference, sponsored by the eleven Western N.M.A.A. Chapters; Sheraton-Palace Hotel. For information, write to P. O. Box 3584 Rincon Annex, San Francisco, Calif.
November 15, 16, 1956 San Francisco, Calif.	Meeting of Operations Research Society of America. For further information, write T. E. Oberbeck, U. S. Naval Post Graduate School, Monterey, California.
November 26–30, 1956 New York City	Third International Automation Exposition and Computer Clinic. Trade Show Building. For information, write International Automation Exposition, 845 Ridge Ave., Pittsburgh 12, Pa.
December 10–12, 1956 New York City	Eastern Joint Computer Conference, Hotel New Yorker. Theme: "New Developments in Computers and Components."
February 26–28, 1957 Los Angeles, California	Western Joint Computer Conference, Statler Hotel. Theme: "Techniques for Reliability."

References

The addresses of publishers and periodicals mentioned in this issue of Data Processing Digest are listed below for your convenience in obtaining further information about the articles or books listed.

The Accountant
4 Drapers' Gardens
Throgmorton Avenue
London EC2, England

American Business
4660 Ravenswood
Chicago 40, Ill.

Automatic Control
430 Park Avenue
New York 22, New York

Automation Consultants, Inc.
1450 Broadway
New York 18, New York

Best's Life News
75 Fulton Street
New York 38, New York

Business Week
330 West 42nd Street
New York 36, New York

Computers and Automation
513 Avenue of the Americas
New York 11, New York

Control Engineering
330 West 42nd Street
New York 36, New York

The Controller
Two Park Avenue
New York 16, New York

Electrical Engineering
500 Fifth Avenue
New York 36, New York

Institute of Radio Engineers
One East 79th Street
New York, New York

Journal of Industrial Engineering
225 North Avenue, N. W.
Atlanta, Georgia

Journal of Machine Accounting
4025 West Peterson Ave.
Chicago 30, Ill.

McGraw–Hill Book Co.
330 West 42nd Street
New York 36, New York

N.A.C.A. Bulletin
505 Park Avenue
New York 22, New York

Nation's Business
U. S. Chamber of Commerce Bldg.
Washington, D. C.

The Office
232 Madison Avenue
New York 16, New York

Office Management
212 Fifth Avenue
New York 10, New York

Operational Research Quarterly
c/o Peter B. Myers
Bell Laboratories
Murray Hill, New Jersey

P. S. Paperwork Simplification
The Standard Register Company
Dayton 1, Ohio

Production
Box 1
Birmingham, Michigan

Reinhold Publishing Corp.
430 Park Avenue
New York 22, New York

Railway Age
30 Church Street
New York 7, New York

Simon and Schuster, Inc.
Rockefeller Center
630 Fifth Avenue
New York 20, New York

Systems and Procedures Quarterly
Box 281 Wall St. Station
New York, New York

The University Press
1621 Connecticut Ave., N. W.
Washington, D. C.

See DPD April 1956 for list of more than seventy periodicals regularly reviewed for significant information in the data processing and related fields.

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